SIGMA

Master clock Sigma C

Installation and operating instructions

The document concerns the following products:

907 461 SIGMA C 110-240VAC - wall

907 463 SIGMA C 110-240VAC - rack

Bodet

www.bodet-time.com

BODET SA
BP30001
49340 TREMENTINES
Tél: +33 241 71 72 99
Fax: +33 241 71 72 01

Réf : 607753 C

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I - Initial Verification

Thank you for choosing a BODET Sigma C master clock. This product has been carefully designed for your satisfaction based on ISO9001 quality requirements.

We advise you to read this manual thoroughly before attempting to set up the product.

Please keep this booklet, so that you can refer to it when necessary.

Bodet accepts no responsibility for any issues resulting from any use not conforming with the guidance in this document.
Any such modification to the product will invalidate the product warrantyee.

1.1 General information

The Sigma C is a master clock which can be used to control slave clocks and heating circuits, lighting, bell ringing and access to the doors of the building.

The master clock has functions which can be programmed from the technician menu.
On first installation, it is essential to program the technician menu (see page 26) before the customer menu.
It is also essential when installing the master clock to program the technician functions in the order in which they appear in the menu.

This product must be installed in a residential, commercial or light industry environment.

1.2 Unpacking the master clock

Checking the equipment :

- master clock Sigma C,
- one USB flash drive,
- one CD containing the PC software,
- this manual.

With (option card) :

- relay card (1 SPDT and 2 SPNO relays) (ref: 907 535).
- 3 external inputs card (ref: 907 542).

1.3 Cleaning

Use an antistatic product identical to that supplied. Never use alcohol, acetone or other solvents which may damage the product casing.

II - Safety rules

Installation and maintenance of this equipment should only be carried out by qualified personnel.

If the master clock is connected to the 230 V mains power supply, its installation must comply with the European standard IEC 364 (NFC 15.100 for France).

⚠ Protection :

110-230V version: the mains supply for this device must include a neutral phase circuit breaker of maximum 6 A C curve, rapidly accessible upstream from the supply.

⚠ For the relay circuits, add protections with circuit breakers of maximum 4 A. Indicate on the labels the location of these protections.

The circuit breaker must be switched off during maintenance operation. Refer to labels in the product.

All cables must be attached either to the wall (wall-mounted version) or to the frame of the cabinet (Rack version) before being connected to the various terminals strips, to prevent any pulling on these terminal strips. In addition, the wires of each terminal strips must be attached to each other to maintain the various isolations if an initial fault occurs.

The time distribution cables must not run alongside high power mains cables (to avoid interference with communication between the master clock and the clocks).

The master clock must be attached (to the wall or rack) before being switched on.

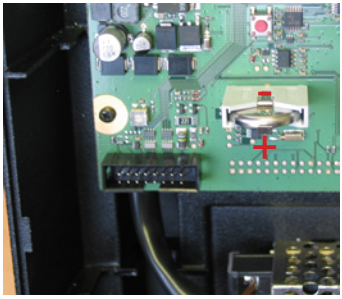
The “RACK” models must be mounted in a 19” cabinet. These components will provide mechanical, electrical and fire protection (only the front panel may remain accessible).

IMPORTANT: before any installation, refer to the “technical characteristics” paragraph.

Remember to make a backup of your programming on the USB flash drive. In case of incident (such as breakdown or thunderstorm), you will have to restore the backup to start the time distribution again.

Caution :

In case of replacement of the CR2032 battery, it is IMPERATIVE to respect the polarity following the opposite indications.



There is risk of explosion if the battery is replaced by an incorrect battery.
Please dispose used batteries according to the instructions of the manufacturer.

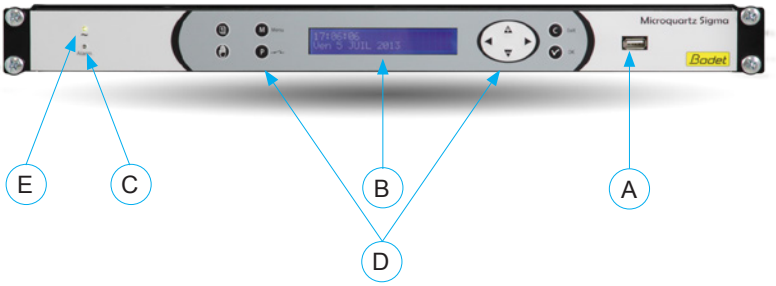
To check the model of the master clock, click ✓ key.

III - Identification - Sigma C

A USB connector
B LCD screen
C Alarm indicator light (red LED)
D Keypad (see page 15)
E Mains indicator light (green LED)

3.1 Wall Sigma C

3.2 Rack 19" Sigma C



IV - Installation

4.1 Mechanical installation

Choose a room with low temperature variations away from any source of electrical interference (contactors, motors, etc.).

4.1.1 Wall mounted version

1/ Loosen the 2 screws on the front.

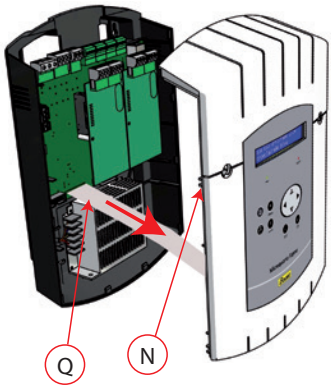
2/ Remove the top cover: slide upward.

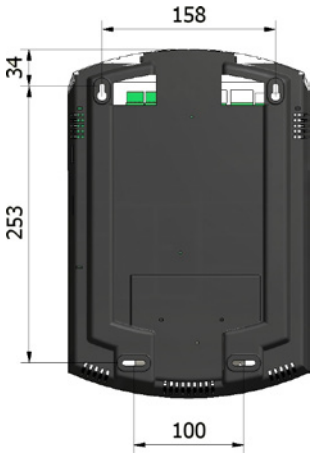
3/ Remove the cover bottom: Press the 2 clips (N) and slide upward.

4/ Disconnect the flat cables (Q) (be careful to connect them the same way round on reassembly).

5/ Attach the master clock to the wall.

6/ When your unit is in place, remove the protective film on the keypad.





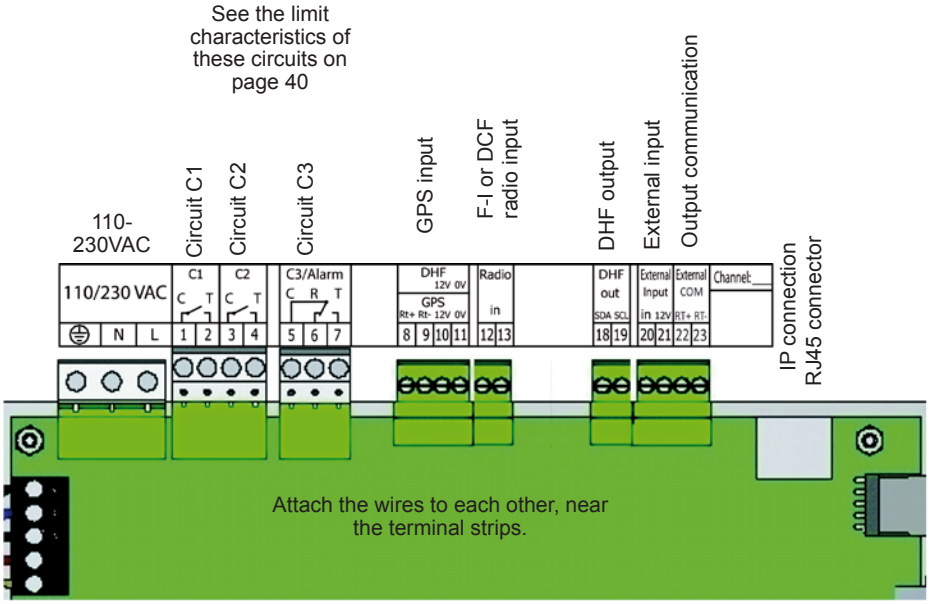
4.1.2 Rack 19'' version

1/ Install the rack in its slot in a cabinet.

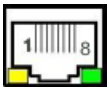
4.2 Electrical connections

4.2.1 Wall mounted version

1/ Connect the cables to the corresponding terminal strips as shown in the figure below.



Meaning of status of LEDs on a RJ45 connector :

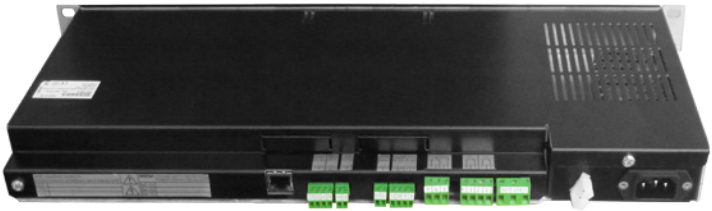


- The green LED reflects network activity.

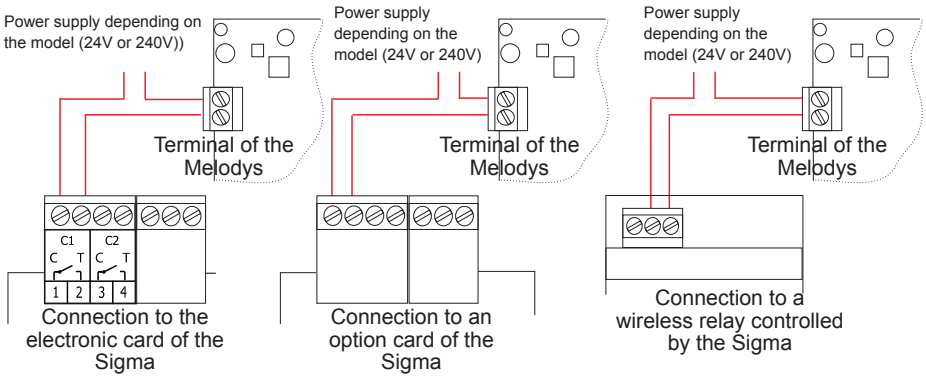
  The yellow LED indicates the speed of the network:
  off=10 Mbps on=100 Mbps.

4.2.2 Rack 19" version

The connectors are directly accessible at the rear of the Rack unit.



4.2.3 Connecting a Melodys :

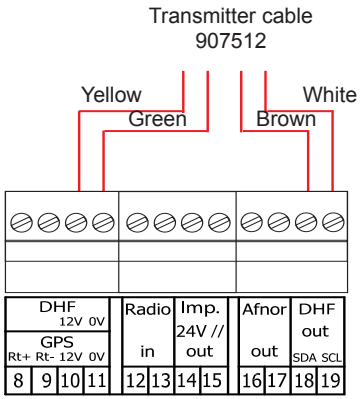


The Melodys can be connected directly to a relay output of the master clock, an option card or a wireless relay.

See page 31 to assign the relay to the Melodys, and page 21 for programming.

4.2.4 Connection of the DHF transmitter

DHF transmitter “Time and relays”, reference 907512.



V - Examples of setting

5.1 Setting a DHF time distribution

1/ The DHF transmitter must be connected (see page 11).
2/ Turn on the power to the master clock.
3/ Enter the technician menu (see page 26).
4/ Enter the “time output” option.
5/ Select the following with the navigation keys :

- the transmission power (25, 125, 500mW),
- the channel (see instruction manual of the DHF transmitter),
- configure the master clock in INIT mode (all the DHF receivers: slave clocks, repeaters, etc. must also be in INIT mode),
- when all the slave clocks are synchronised, configure the master clock in START mode (automatic after 4 hours).

6/ Then, validate your settings by pressing the ✓ key.

Note: when adding DHF receivers, you do not have to enter the technician menu. The “Add DHF receivers” option in the user menu is sufficient.

5.2 Programming a RHF circuit

1/ Install the wireless relay.

2/ Configure the address of the corresponding RHF circuit using the DIP switches from 5 to 8 (default address is 60).

Note : several wireless relays can have the same address as long as control is the same (e.g. control of outdoor lighting).
3/ In the technician menu, assign the relay (see page 31).
4/ Program the circuit (see page 21).
5/ Place the master clock in INIT mode (see page 17).
6/ Check it works correctly with ✋ key.

Note : commands are sent to the wireless relays every hour, any time the programming is modified and when leaving the menu.

After two hours of no reception, no more steps are executed and the led of the relay turns red.

5.3 Install an option board

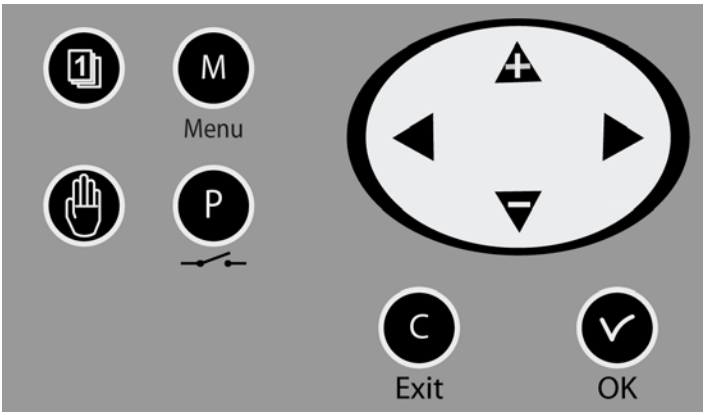
1/ Switch off the master clock, open it, see page 37.
2/ Install the option board in the slot, fix it with the screws provided and put the label in front of it.
3/ Connect the output or input lines of this board.
4/ Close the SIGMA C and switch it on.

please note: in the “Time outputs” technician menu, “DEL” mode is used only to uninstall an option board from the master clock.

Caution: each Sound module counts for one extension card of the master clock (Max. 2 options boards).

VI - Operating master clock

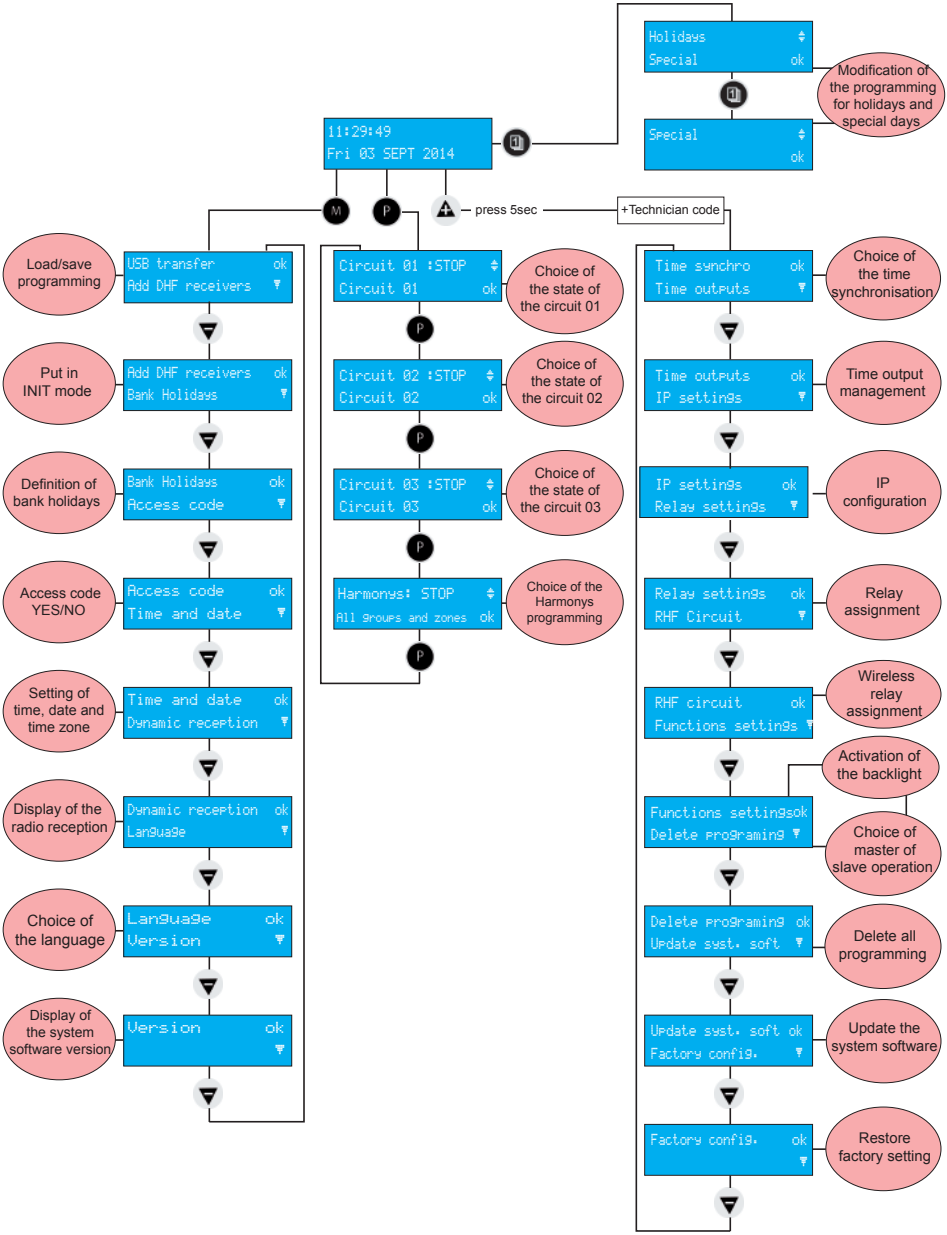
6.1 Key functions



Keys	Functions
	Calendar key.
	Test key.
M	Menu key.
P	Program key.
C	Correction key.
	Validation key.
, , ,	Navigation keys.

Please note: the exit from the menus is automatic if a key has not been pressed for one minute in the customer menu or for 5 minutes in the technician menu.

6.2 Synoptic diagram of the programming



VII - Main menu programming

7.1 Standby state

In normal operation the master clock displays the time and date :

Ψ is the radio signal indicator, which flashes if reception is poor.

If a bank holiday, a special day or a holiday period has been programmed on this given day, the master clock indicates this via a display during the period in which it applies, with priority management.

7.2 User menu

To access the user menu, press the menu : the M key.

Enter the user access code if necessary (see page 18).

Access the menu options using the ▼ key and validate with the ✓ key.

The user menu options are :

1/ USB transfer,
2/ Add DHF receivers,
3/ Bank holidays,
4/ Access code,
5/ Time and date,
6/ Dynamic reception,
7/ Language,
8/ Version.

7.2.1 USB transfer

The master clock can load or back up its programming via a USB flash drive.

Before creating a new programming with the software, you will need to save the existing one on your USB drive, and transfer.

Validate the option with the ✓ key.

The following screen is displayed :

Insert the USB flash drive and validate with the ✓ key.

To load a Program in the master clock :

1/ Validate the option with the ◀ key.
The master clock will search for the files available on the key (.sig extension).

2/ Select the file to be loaded using the ▼ and ▲ keys.

3/ Validate with the ✓ key.
The loading is then carried out. When it is completed, the unit displays :

To back up the existing Program of the master clock :

1/ Validate the option with the ▶ key.
The master clock saves the file with an automatically allocated name in the format: save1_DD_MM.sig (The number (1, etc.) and the date are incremented automatically).
It is possible to rename this file from the PC, while keeping the same ".sig" extension.
Once the backup is completed, the unit displays:

7.2.2 Add DHF receivers

To place the master clock in "DHF initialisation" mode and enable synchronisation of new equipment :

1/ Validate the initialisation mode with the ✓ key.
The following screen is displayed :
2/ Select the "ACTIVE" mode using the ▼ and ▲ keys and validate with the ✓ key.

The "init" display mode will appear alternately with the normal display during this period (4 hours).
It is possible, once the receivers are DHF initialized, to stop this mode in this menu.

7.2.3 Bank holidays

Bank holidays saved via the PC software (maximum 20 dates) are managed by master clock.
By default, French bank holidays are active.
Bank holidays can be added and configured through the PC software.
Validate the option with the ✓ key.
The following screen is displayed:

Choose YES / NO to activate the bank holidays calendar. Bank holidays will be considered to be Sundays (the weekly programming for Sundays will be used on bank holidays).

7.2.4 Access code

To enter or remove the master clock access code :

1/ Validate the option with the ✓ key.

The following screen is displayed :

2/ Choose the option you require and validate it with the ✓ key.

The access code is fixed, ▲, ▶, ◀, ▼.

If there are 3 attempts with the wrong access code, an alarm message appears. The keyboard is locked for 10 minutes. It is possible to unlock it from the technician menu.

7.2.5 Time and date

To change the time or the date of the master clock :

1/ Validate the option with the ✓ key.

The following screen is displayed :

2/ You have access to the time zone selection.

The time zone selection allows you to automatically manage winter/summer time changeovers.

If the zone is not available in the 20 pre-programmed towns or time zones, select “PROG” mode which is programmed in the technician menu.

3/ “PROG” mode allows you to configure personalised time zone differences and time changeovers.

By default it is in “PROG” mode.

4/ The hour is flashing: set the hour using the ▼ and ▲ keys and move on to the minutes with the ▶ key.

5/ Proceed in the same way for the date.

6/ Validate with the ✓ key. If the time has been changed, the seconds are reset to 0.

7.2.6 Dynamic reception

To view the dynamic reception of the master clock, validate the option with the ✓ key.

If the reception is correct, the time and date will displayed automatically.

If the master clock is synchronised by a GPS antenna, the time displayed is GMT.

If the master clock is synchronised by a France-Inter or DCF antenna, the hour is displayed.

7.2.7 Language

To select the language of the master clock:

1/ Validate the option with the ✓ key.

2/ Select the master clock display language from the different options available.

The languages available are : FRENCH, ENGLISH, SPANISH, GERMAN, DUTCH, PORTUGUESE, NORWEGIAN and DANISH.

7.2.8 Version

To view the version of the master clock, validate the option with the ✓ key.

The following screen is displayed :

VIII - Programming the circuits

8.1 Prerequisite before programming circuits

The programming and set up of Harmonys sounders on the computer network is done on the software. Please refer to the manual (ref: 607752).

Programming circuits for Melodys and relay (physical or DHF). The different levels of the programming of these two modes are described below.

8.2 Presentation of the circuits

The master clock has three programmable (hard-wired) circuits allowing contacts (relays) to be activated.

The option boards allow relays to be added.

See the circuit setting programming in the technician menu on page 31.

The programming circuit menu is accessed by pressing the P key.

The programming can be carried out simply on a PC and be imported via the USB port of the Sigma (see “USB loading and backup”, on page 16).

The configuration of the circuits can be displayed at any time.

Assignment of the relays as a programming circuit or as a melody output is carried out in the technician menu.

Depending on the requirement, the relay number is therefore a control circuit (no. 1 to 3) or an HF relay circuit (no. 60 to 75) or an HF melody control circuit (no. 60 to 75 with a musical note pictogram).

On this screen, you see the first circuit, its status (Start or Stop) and the name of this circuit on the second line.

To view the various circuits, continue to press the P key.
Use the ▼ and ▲ keys to select the mode of the circuit.

Description of circuit statuses :

- STOP : program steps not activated.
- START : program active.
- DISPLAY : to view the program steps without modifying them.
- PROG. : to go to circuit programming.
- DELETE : to delete all the program steps of the circuit.
- STATUS : to view the status of the circuit.

To change the name of the circuit, use the ▶ key. Use the ▼ and ▲ keys to select the characters of this text and validate with the ✓ key.

8.3 Viewing the circuits

1/ Select the number of the circuit you wish to view with the P key.
2/ Select DISPLAY mode with the ▼ and ▲ keys.
3/ Validate with the key ✓.

The display of the parameters is fixed and the step numbers flash.

The ▼ and ▲ keys can be used to scroll through all the program steps.

Use the C key to exit from the menu at any time.

The program steps are displayed in the order of the times and then by type: weekly order, holidays, special and then PC.

Steps 01 to 99 are indicated with the total number of steps; if the step is greater than 99 then only the step number from 001 to 500 is displayed.

8.4 Programming the circuits

1/ Select the number of the circuit you wish to program, or modify the programming with the P key.

The circuits can be programmed in the following modes:

- Weekly,
- Holidays,
- Special,
- Public holidays,
- Additional step,
- Astronomical,
- Periodic.

Only the first 4 modes are accessible from the master clock. All the modes are accessible from the PC software.

2/ Select PROG mode with the ▼ and ▲ keys and validate with the ✓ key.
If the first step is blank, the time flashes.

3/ Enter the time with the ▼ and ▲ keys and then validate with the ▶ key.

4/ Proceed in the same way for the minutes and then the seconds.

5/ Enter the status of the circuit for this program step, choosing from ON, OFF, 01s (length in seconds which can be set using the and keys) and DEL (DEL mode is used to delete the selected step), and then validate with the key.

If the circuit is a melody circuit, you have to select the melody number and the number of times it must be played (from 1 to 4).

Validating the entry with the key allows us to move on to the second line.

6/ Select the days on which this program line will have to apply using the and keys and then select the mode, choosing from:

WEEKLY: WEEKLY mode functions all year with application of bank holidays if programmed.

HOLIDAYS: HOLIDAYS mode stops weekly (and bank holiday) mode for a programmed period and activates the programming of the relays with HOLIDAYS mode.

SPECIAL: SPECIAL mode deactivates weekly and holidays mode and starts the steps in SPECIAL mode.

PUBLIC HOLIDAYS: the PUBLIC HOLIDAYS mode activates the program step only for the Public holidays; it has priority over the Sunday programming.

7/ Validate the step with the key.

If you have programmed, the value in seconds is stored and proposed for the next step.

NOTE: you can press the key on the first step of the program or on the time parameter to access the previous step or a blank step. On the last step, it allows you to add a new step or correct a previous step.

In this new step, press the key to restore data from the first line of the previous step. The program steps can be entered in any order. After validation, the system will reorganise the steps by time and then by type.

8.4.1 Add a program step

1/ Select the number of the circuit you wish to add a program step using the key.
2/ Select the PROG mode with the and validate with the key.

3/ Press the key on the first step of program to access to a blank step.

4/ Program the step and validate with the key.

8.4.2 Delete a program step

1/ Select the number of the circuit you wish to delete a program step using the P key.

2/ Select the PROG mode with the ▼ and ▲ validate with the ✓ key.

3/ Select the program step to be deleted with the ✓ key.
4/ Select the EFF mode and validate.

8.4.3 Modify a program step

1/ Select the number of the circuit you wish to modify a program step using the P key.
2/ Select the PROG mode with the ▼ and ▲ validate with the ✓ key.

3/ Select the program step to be modified with the ✓ key.
4/ Modify and validate.

8.5 Deleting a program

1/ Select the number of the circuit you wish to delete using the P key.

2/ Select DELETE mode with the ▼ and ▲ keys and validate with the ✓ key.

After validation, all the steps of the program are deleted.

8.6 Viewing the status of a circuit

1/ Select the number of the circuit which you wish to view the status of by pressing the P key.

2/ Select STATUS mode with the ▼ and ▲ keys and validate with the ✓ key.

You will see the theoretical status of the programming circuit: ON, OFF, FORCED ON (if the circuit is forced manually to ON) or ACTIVE (if an action is in progress).

IX - Manual testing of circuits

While the status of a relay is displayed, it is possible to test it.

1/ Select the circuit you wish to test with the key.

If the circuit is a relay circuit:

1/ Start the test with the key.

- If you press it briefly (for less than 3 seconds), the relay is activated (ON position) for as long as the key is pressed.
- If you press it for a longer period (more than 3 seconds), the relay is activated (ON position), and if you press it again the relay is deactivated (OFF position).

If the circuit is a melody circuit :

1/ You can select the melody to be tested with and keys.

2/ Start the test with the key.

If you press it briefly (for less than 3 seconds) = the melody is played once.

If you press it for a longer period (more than 3 seconds) = the melody is played loop until you press it again.

If the circuit is a Harmonys circuit :

1/ You can select the melody to be tested with and keys.

2/ Start the test with the key.

If you press it briefly (for less than 3 seconds) = the melody is played once.

If you press it for a longer period (more than 3 seconds) = the melody is played loop until you press it again.

X - Programming in Holidays and Special Day mode

10.1 Prerequisite before programming in holidays and sepcial day

The programming and set up of Harmonys sounders on the computer network is done on the software. Please refer to the manual (ref: 607752).

Programming circuits for Melodys and relay (physical or DHF). The different levels of the programming of these two modes are described below.

10.2 Programme details

The programming of the master clock can be modified during a holiday period and for a special day.

1/ To access this menu, use the key.

It is possible to enter dates for a holiday period or for a special day. By default, the Holidays mode flashes.

2/ Select Holidays or Special mode, and then validate with the key.
The first date flashes.

3/ Enter the dates with the and keys and then validate with the key.

You can enter only one date-to-date series in Holidays mode on the unit, but it is possible to enter 20 periods with the software on the PC.
Only the next period can be accessed and modified using the master clock keypad.
If only the start date is entered (= 1 day), then the start date is the same as the end date.
If the start date is not entered and only the end date is entered, the programming is not executed.
It is possible to choose Holidays or Special application mode on all the circuits in a single operation.

If the “ALL CIRC.” Option is validated, the Holidays (or Special Day) mode will apply on all the circuits or melodies of the master clock.

If the “SELECT” or “ALL EXCEPT” option is validated, it is then possible to enter the circuit numbers concerned by this programming either by selecting them one by one or by omitting them (“all circuits except”).

You must then select the circuits concerned.

4/ Scroll through all the circuits with the and keys and validate with the and keys if they are concerned by the holiday period.

If the “ALL EXCEPT” option is validated, only the selected circuits will not be affected by the Holidays mode.

XI - Technician menu programming

The technician menu is accessible via an access code sent to the approved persons.

Press one of the navigation keys for a few seconds.

A code is then requested.

The technician code is a fixed code, , , , and M.

You then have access to the technician menu,

Validate the required option with the key, or access the following options with the key.

The options in the technician menu are :

1/ Time synchro,

2/ Time output and DHF management (impulses, D1 D2, Afnor, DHF) and output time zone differential,

3/ IP configuration,

4/ Alarm and D1 D2 relay assignment,

5/ RHF box assignment,

6/ Function assignment,

7/ Delete all programming,

8/ CPU hardware software download (.cod extension),

9/ Restore factory configuration.

Validate the required option with the key.

To exit the technician menu, press the C key.

11.1 Time synchronisation menu

To configure the time synchronisation of the master clock, validate the option in the technician menu with the ✓ key.

The following screen is displayed :

Select the time synchronisation mode from the following options:

Radio FI/DCF,

Minute radio (mode used for countries receiving the FI/DCF radio signal but for which the time is different from Paris/Berlin [only minute is synchronised, date and hour must be set manually]),

EXTERNAL (mode used for synchronisation from a Sigma “Master” which transmits a GPS signal simulation from an ASCII extension card),

NONE: if you choose to have no synchronisation, the radio pictogram is not displayed.

GPS,

NTP, In the case of redundancy in multicast, configure the emission period (poll) at a ratio of 1: 2 between the servers (eg. main transmitter: 32s, secondary transmitter: 64s). Number of simultaneous requests as possible: 500 unicast requests per second (driving an unlimited amount of clocks).

Auto (the master clock will select the best time source automatically; in which case, several time sources can be connected to the master clock; it will change time source in case of failure of one of them; the priority is given at first to NTP then AFNOR, GPS, FI / DCF).

Remark : all the synchronisation options are proposed without checking that an antenna is connected (by default, the configuration is FI/DCF mode).

In case of synchronisation input failure, an alarm message is sent.

This alarm is triggered after 3 hours without synchronisation in NTP or Auto mode, after 24 hours in the other synchronisation modes.

Select the synchronisation mode with the ▼ and ▲ keys and validate with the ✓ key.

The following screen is displayed if “Prog” mode has been validated in the customer menu (see “Time and date”, page 18) :

This menu can be used to program non-standard winter/ summer time changeovers.

11.1.1 Programmable time changeover

This menu can be used to program the summer/winter time changeover dates. It allows you to define the start of the winter period and then the start of the summer period.

To program the summer/winter time changeovers, validate with the ✓ key.

- Set the start date of the winter period using the ▼ and ▲ and ▶ key.

The following steps then happen:
The “Rank” flashes. The Rank designates the order number of the day of the week in the month[1] (1 to 5 depending on the month) (rank 5 always indicates the last week).
The “*day*” flashes.
The “*month*” flashes.
The “*time*” flashes.
Validate with the ✓ key.

- Set the start date of the summer period using the ▼ and ▲ and ▶ keys.

Validate with the ✓ key.

Whatever the synchronisation mode (radio France Inter or GPS), this forces the automatic time changeover for radio FI or DCF.
Set the start date of the winter period and then the summer period using ▼ and ▲ and ▶ keys.
Validate with the ✓ key.

11.1.2 Setting the time base

This menu can be used to set the drift of the time base. This can be useful when the master clock has no external synchronisation.

To access this menu, you need to have selected “None” mode in the external synchronisation menu.
Set the drift using the ▼ and ▲ keys and validate with the ✓ key.
This correction is not taken into account when the master clock is synchronised.

1 Example of Rank calculation: the second Monday of the month or the second Thursday of the month have rank “2”, while the last Tuesday of June has rank “5” as there are no more than 5 weeks in a month.

11.2 Time output management menu

Programming by PC software allows the time zone differential of each output to be set with respect to the local time.
This menu can be used to view all the time outputs, modify their status (Start/Stop) and configure the DHF distribution in Init mode.

To go to the master clock time output management menu, validate the option in the technician menu with the ✓ key.

The following screen is displayed :
On this screen you can start or stop the NTP distribution.
The programming is carried out by software. See NTP programming in appendix 1, page 42.

Important: the NTP distribution service must be started first from the PC software.

Validate with the ✓ key. The following screen is displayed :

You can view the different options and change the values using the ▼ and ▲ keys.

You can go through the different outputs by validating using the ✓ key.

The placing of a DHF output in “INIT” status is active for 4 hours before return to START mode (The init mode display alternates with the normal display during this period).

This menu can be used to set the power of the DHF output with a choice of 25mW / 125mW (by default) / 500mW and assign the system address from 1 to 4 (2 by default).

The buzzer mode allows you to activate a buzzer on the secondary transmitters in order to identify them.

Use the ▶ key to move on to the next parameter:
Choice of status (“Start”/“Stop”).
Circuit stopping must be confirmed.
Use the C key to return to the previous screen.

or

11.3 IP configuration menu

This menu is used to configure the IP parameters of the master clock.

To enter the master clock IP configuration menu, validate the option in the technician menu with the ✓ key.

The following screen is displayed :
If DHCP[1]=YES, then it is the network's DHCP server which gives the product its IP parameters.

If you wish to give the Sigma C a fixed address, validate this option (set to No) with the ✓ key.

The following screen is displayed:

Enter the IP address and then validate.

The following screen is displayed:

Enter the sub-network mask and then validate.
The following screen is displayed:

Enter the address of the gateway and validate the option in the technician menu with the ✓ key,
This data is neither saved nor present in the printing.
After validation, the master clock restarts automatically to take into account the DHCP changes.

1 Dynamic Host Configuration Protocol (DHCP) is a term designating a network protocol which carries out an automatic configuration of the IP parameters of a station, notably by automatically assigning it an IP address and a sub-network mask.

11.4 Relay setting menu

This menu can be used to assign the relays (D1D2 and alarm).

To go to the master clock relay assignment menu, validate the option in the technician menu with the ✓ key.

The following screen is displayed :

By default, relay 3 (R/T relay) is assigned to the “Alarm” output.

Note: when no alarm is active, the alarm relay is set to ON.
To allow it to be used for another function (control of heating, lighting, etc.), these relays must be set to No in this menu.

The relay option boards are recognised immediately on connection in the master clock. If the board is removed the programming is retained. It is deleted either with the PC software or in the technician menu with the “Del.” option.

The assignment of the hard-wired relays is automatic. If a relay board is connected, the 3 relays will be defined according to the following logical output number :

Slot 1, relays 4, 5 and 6,
Slot 2, relays 7, 8 and 9.

11.5 RHF circuit function setting menu

This menu can be used to assign the HF relays (16 address[1] maximum).

To go to the master clock relay setting menu, validate the option in the technician menu with the ✓ key.

The following screen is displayed :

Assign the RHF circuits to melody, relay or —- (not present) mode, MEL, REL, or, —-.

The RHF circuits are declared from 60 to 75.

1 Please note: several relays can be configured on the same address (for example for the same external lighting control).

11.6 Function setting menu

This menu allows you to define allocation of the external input of the mother board. It depends if you are using the master clock as master or slave unit.
If the master clock is used as a master, the external input will, for example, control circuitry to drive an alarm or buzzer.
If the master clock is used as a slave, the external input (terminals 20 and 21) will detect changes in the alarm output of the master clock used as master.
It can also be used to activate the backlight of the display screen.

To go to the Sigma C function setting menu, validate the option in the technician menu with the ✓ key,

The following screen is displayed :

The master clock is configured in master mode by default.

If you configure it in “BACK-UP” (slave) mode to assign it as a secondary master clock, then the external input (see below) displays BACK-UP and cannot be modified.

Select a circuit for the external input; the relays proposed are the relays which have been assigned.
In general, the external input will control a circuit dedicated to this alarm ringing function, relay ON ….

A contact connected to the external input can also control simultaneously several circuits. The circuits to be controlled must be specified in the PC software. Example: Circuit 1 + Circuit 2 + Circuit 60 + Circuit 13.
Choosing the mode (START, LENGTH or FORCED ON) allows you to configure the input for its functioning and the period of functioning in this state.

START: starts the programming of the circuit concerned the first time it is pressed and stops it the next time (alarm type message on the display indicating the external input (circuit 1) and its status (ON, OFF or START).

LENGTH starts the relay in ON mode during the programming period HH MM SS. Pressing Enter puts the circuit in stop mode.

FORCED ON: forces the relay position whatever the programming (as in test mode); 1st pressing ON, 2nd pressing OFF.
A switch can be placed on the output to configure the status of the input as ON or OFF permanently.

The following screen can be used to activate or deactivate the idle screen backlight (by default, the backlight is lit, therefore the value is set to No).

11.7 “Delete all programming” menu

This menu can be used to delete all the programming.
To go to this master clock menu, validate the option in the technician menu with the ✓ key.

The following screen is displayed :

To delete, validate with the ✓ key.

11.8 CPU software download menu

This menu allows you to update the program code in Flash.
In the www.bodet-time.com/en/support.html, click on “Downloads”. Download the latest version of the programs on your USB flash drive.
To go to this master clock menu, validate the option in the technician menu with the ✓ key.
The code file (*.cod) must be on the root of the USB flash drive and be the only “.cod” file.

The following screen is displayed :
to download,
validate with the ✓ key.

The following screen is displayed :
validate with the ✓ key.

11.9 Factory setting restoration menu

This menu can be used to reinstall the initial factory setting.
To go to this master clock menu, validate the option in the technician menu with the ✓ key.

The following screen is displayed :
To reinstall the factory configuration, validate with the ✓ key.

XII - Priority of execution of programs

Function	Priority
Circuit 1 in alarm, circuits 2 and 3 in time distribution (D1D2 tower clock)	1 (high)
Manual control of relays	2
Manual selection of a particular day (bank holiday / day before bank holiday / special day)	3
Programmed special day	4
Programmed holidays and bank holidays	5
Weekly program	6 (low)

When the master clock *is configured in one of the modes, all the program steps of the lower-priority modes are ignored.*

The “astronomical” and “periodic” modes, which are accessible only via software programming on a PC, do not have high priority (the astronomical, periodic and weekly modes, which will rarely be programmed together on the same circuit, are lumped together at low level).

XIII - Alarm messages

By default, the alarm configuration is :

- Activated: if an alarm is present, a message is displayed on the readout,
- Alarm relay: relay 3 is activated if an alarm is triggered.
- E-mail: the Sigma sends an e-mail (see messaging programming in the PC software),
- SNMP: the SNMP server will receive a message (trap).

If the display of alarms was selected by the installer at the time of configuration of the unit (See **11.4 Alarm configuration**, page 31), the master clock can display alarm messages :

If an alarm is active, the display alternates between the date and the alarm message.

Press the ▶ key to view additional information on this alarm.

Example :

If several alarms are active simultaneously, the display is:
Press the ▶ key to view the additional information.

Press the ▼ key to view the following alarms.
The alarms are displayed in chronological order.

To acknowledge an alarm, press the ✓ key.

Alarm activation is immediate for all alarms, except for the synchronisation alarms for which the activation times are as follows :

- Absence of NTP synchronisation: 3 hours,
- Absence of FI, DCF or GPS synchronisation: 24 hours.

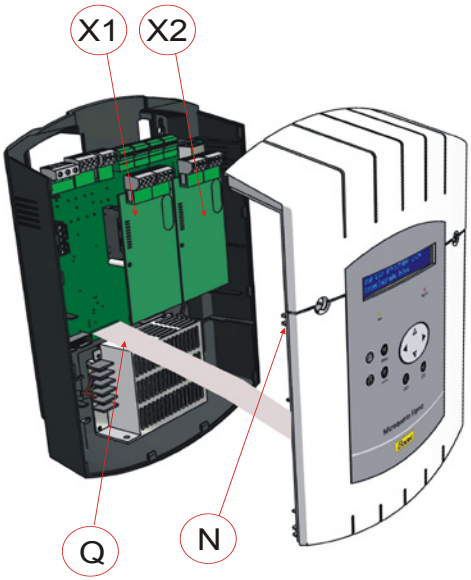
In the Auto mode, if there is no synchronisation from the primary source for more than 2h30, the Sigma switches to the next source and if there is still no synchronisation after 30 minutes then the Sigma activates the alarm.

Alarm message	Meaning
user code fail.	The user code has been entered three times incorrectly; the keyboard is blocked for 10 minutes.
tech.code fail.	The technician code has been entered three times incorrectly; the keyboard is blocked for 10 minutes.
battery failure	The lithium battery used to save configuration data is defective; replace the battery after making a backup of configuration data.
master failure	The main master clock is defective; control the main master clock. If a Sigma SWITCH is used, the stand-by master clock will automatically take over.
sync. failure	The synchronisation source is faulty. In case of synchronisation input failure, an alarm message is sent. This alarm is triggered after 3 hours without synchronisation in NTP or Auto mode, after 24 hours in the other synchronisation modes.
DHF failure	The DHF output is defective.
Circuit failure	The relay extension card does not answer; check the presence of the card.

XIV - Options

The master clock can be fitted with option boards to extend its capacities.
The option boards are installed “cold” and are automatically recognised when the master clock is switched on.
The option boards are programmed with the software on PC.
Caution: each Sound module counts for one extension card of the master clock (Max. 2 options boards).

14.1 Mechanical installation



14.1.1 Wall-mounted version

1/ Unscrew the 2 screws on the front.

2/ Remove the top cover : pull up.

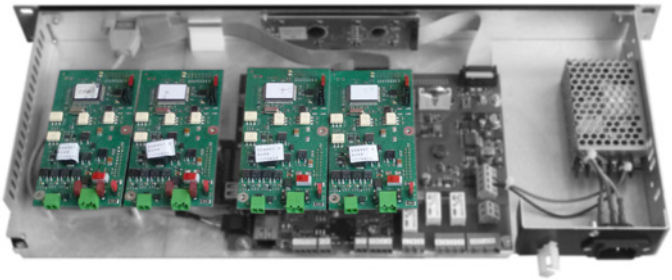
3/ Remove the cover bottom : Press the 2 clips (N) and pull up.

4/ Disconnect the flat jumpers (Q) (be careful to connect them the same way round on reassembly).

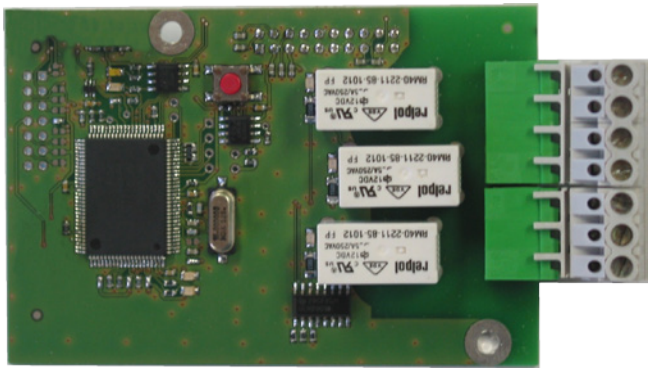
5/ Install the option board(s) in the slots provided (X1) and (X2).

14.1.2 Rack 19’’ version

1/ Open the rack unit
2/ Install the option board(s) in the slots provided.
3/ Stick labels in front of the card.
For relay cards, stick the safety label on the upper cover.



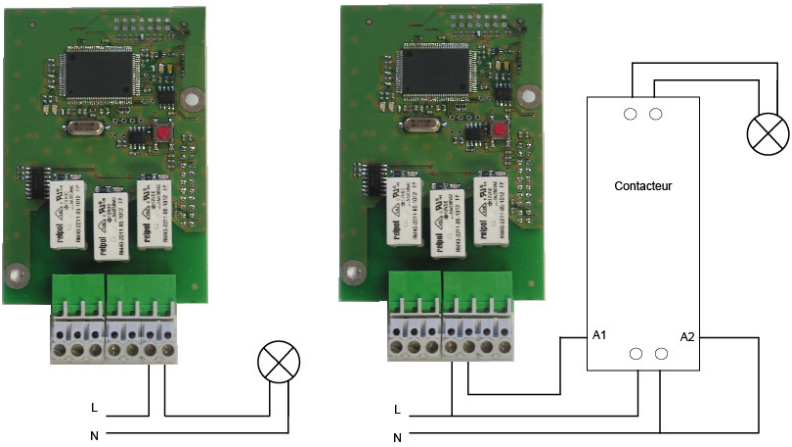
14.2 Relay option board



This option board does not require any software programming.
It allows 3 relays to be added.
See the technician menu (circuit setting programming) on page 26.

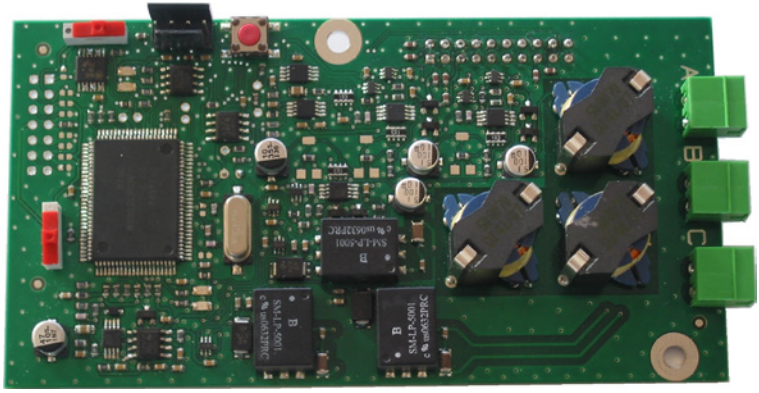
Please note: in the time output management menu of the technician menu, “DEL” mode is used only to uninstall the option board from the master clock.

Examples of wiring



⚠ For relay circuits provide protection by disconnecting the fuse or circuit breaker maximum 4A. Please indicate on the terminal label the location of these protections.

14.3 Three inputs option card



This card allows the addition of 3 external inputs.

1/ Connect the lines carrying the external information to the inputs A, B and C.
The parameter setting is accomplished with the PC software.
See paragraph “USB transfer” page 17.

To set the parameters of these inputs you must define:

2/ The extension card number and its status (Run/Stop).

3/ The operating mode (ON, ON/OFF, OFF, Prog) of each input (A, B, and C).

ON, pressing once on the contact turns the input ON,
ON/OFF pressing once toggles the input from one state to the other,
OFF, pressing once turns the input OFF,
Prog, pressing once activates the programming (switch from the Stop state to the Run state).

4/ The selection of the involved circuits.

All the circuits,
All the selected circuits, select the circuit(s) to be activated,
All the circuits but the one selected, select the circuit(s) that must not be activated.

5/ The duration of the activation of the circuit (ON).

6/ Melody circuit, select the melody and the number of times that it must be played.

XV - Technical characteristics

	Designation	Characteristics		
Electrical	Backup	Permanent backup of all parameters in case of mains failure. Automatic resetting of receiver clocks to correct time after mains restoration.		
	Time base	Quartz, accuracy 0.1 seconds per day between 20 and 25°.		
	Capacity	500 program steps per circuit.		
	Power supply	115 or 230 V AC ± 10% 50/60 Hz.		
	Maximum consumption	35W.		
	Power supply terminal block	Rack: rigid or flexible cable with end piece with cross section 1² to 1.5² Wall-mounted: rigid wire 1² to 1.5² bared 6 mm.		
	Other terminals	Cross section 1.5² maximum, bared 6 mm.		
	Electrical isolation	Class 1.		
	Mains power supply system	TT or TN system.		
Relays	Control of 3 relays	Programmable in weekly or annual mode		
	Control circuit (relay) isolation	Galvanic isolation.		
	Circuit operating voltage	Either SELV* or LV** with common phase (230 V maximum between the 2 circuits).		
	Relay breaking capacity	240V AC 1A.		
	Usefulness of indicator light (of each circuit)	1) Lit when contact closed. 2) Used to indicate the current circuit programming.		
	Relay statuses	Standby/work on circuit 3. Normally open on circuits 1 and 2.		
Outputs	Synchronisation	Depending on model, on FI, DCF, MSF or GPS antenna.		
Mechanical	Protection index	Wall-mounted : IP41 / Rack : IP 20		
	Operating temperature	0 to 50°C		
	Keypad locking	By access code		
	Dimensions		WALL-MOUNTED version	19» RACK Version
		Width	220 mm	483 mm (1 width)
		Height	322 mm	44 mm (1 U)
		Depth	83 mm	200 mm
	Weight		0,8 kg	1,4 kg

* SELV: safety extra low voltage (voltage < 42.4 V peak or 60 V continuous).
**LV: low voltage > 42.4 V peak or 60 V continuous.

XVI - What to do if ...? Check that …

What to do if ...?	Check that …
The green LED does not light up when the unit is switched on.	1) Check that the mains is present (D). 2) Check that the terminal strips (K) are correctly positioned on the printed circuit. 3) Check that the flat cable (Q) of the keypad is correctly connected on the terminal strip on the printed circuit.
The mains is present but there is no secondary voltage.	1) Check that the terminal strip is correctly positioned on the printed circuit. 2) Replace the transformer after checking that there is no short-circuit.
No message appears when the unit is switched on.	3) Check that the flat cable (Q) of the display is correctly connected on the terminal strip on the printed circuit.
Nothing happens when a key is pressed on the keypad.	1) It is possible that the key has not been pressed long enough. 2) Check that the flat cable (Q) of the keypad is correctly connected on the terminal strip on the printed circuit. 3) Check that the keypad is not locked (incorrect access code entered).
With an antenna connected, the “radio” pictogram is still flashing.	1) Check that a radio synchronisation antenna is connected to the unit and that its LED is flashing. 2) Wait at least 4 minutes.
There is drift of the time base.	1) Refer to the section on setting the time base drift.
There is considerable drift (> 0.5 seconds per day) of the time base.	1) Send the equipment back to the BODET maintenance department.
An alarm is displayed.	1) To acknowledge the alarm, after setting the problem with this alarm, press the ▶ key and confirm with the ✓ key. If the problem persists, please call Bodet technical support.

Appendix I : NTP programming

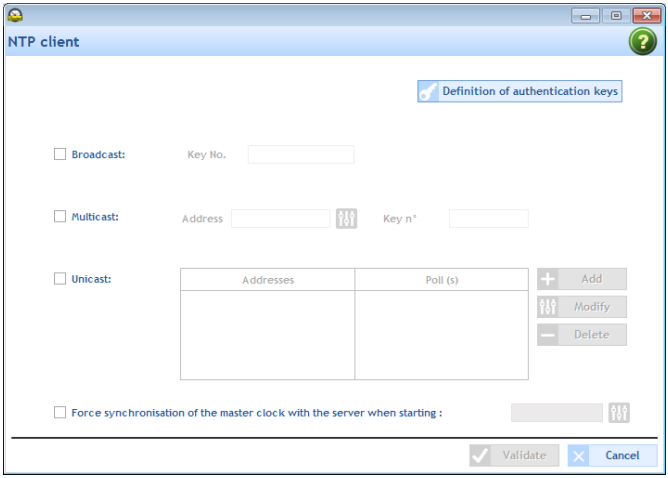
IP function programming

The programming is carried out in 2 steps.

1 – Program the IP output (parameters supplied by the network administrator) from the technician menu of the master clock (see page 26).

2 – Software configuration.
Start the PC software and then load the USB backup of your master clock.
In the menu, select “Time outputs” and “NTP server client”.

The master clock is an NTP client
In the **Configuration** menu, select **Time base** then in the section **Time synchronisation** select **NTP** from the dropdown menu



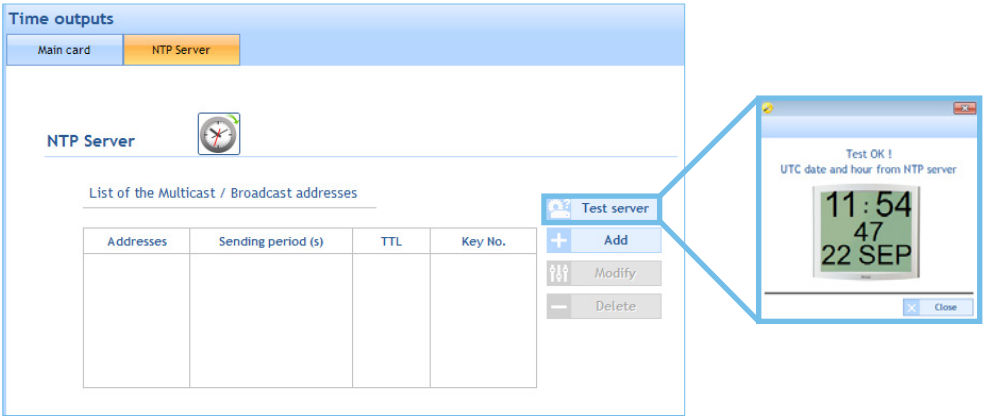
On this NTP Client screen, it is possible to choose the mode of transmission of the time signal.

Broadcast : the Sigma receives the time sent to all the products in the network.
Multicast : the Sigma receives the time sent only by the address on which the server transmits.
Unicast : the Sigma receives the time sent by a few selected NTP server IP addresses.

It is possible to add the key number of the server to make the distribution secure. The “Force master clock time setting with respect to server on starting” option will order the master clock to connect to the address of the server and take the time there on starting.

Caution: The NTP user does not synchronize if the difference between the client and the server is greater than 1000 seconds.

The master clock is the NTP server
In **Configuration** menu, select **Time outputs** and select **NTP server.**



In NTP server mode, the master clock sends the time to the selected IP addresses with the selected mode of transmission.
The clients will be in Broadcast or Multicast mode.
For unicast client, you will have to enter the IP address of the master clock in the configuration parameters of the client.
In the menu, select “Alarms” (see page 35).
The master clock system alarms can be sent by e-mail to the selected addresses (up to 5 addresses), and by SNMP.

IP network configuration and protocols supported

- Ethernet 10/100 BASE-T network via RJ45 with 10/100 automatic switching.
- NTP V2, V3 and V4
    - NTP in unicast mode,
    - NTP in broadcast mode,
    - NTP in multicast mode,
    - Possible protection by secret keys,
    - capacity: maximum 500 connections per second.

Caution: MICROSOFT does not guarantee any compatibility with the NTP protocol.
A Windows 2000 server does not allow you to synchronise an NTP client (in this case use third party client / server software).

A Windows 2003 server can synchronise an NTP client.
Linux servers, on the other hand, are entirely compatible.

- SNTP (Simple Network Time Protocol).
- DHCP client.
- SMTP client (Alarm message via e-mail).
- SNMP trap V2c (Alarm message via SNMP).

Please note : NTP time is always UTC or GMT time.

Appendix II : quick start guide

Enablinge/disablinge the circuit

- Press the P key.
  - The first circuit will be displayed.
  - Repeatedly press the P key to select the desired circuit.
  - The circuit mode will flash.
  - Select the desired mode with the ▲ or ▼ key.
  - Press the ✓ key to validate.

Start: enable circuit.
Stop: disable circuit.
Status: check circuit status.
Delete: erase existing schedule.
Prog: program schedule (create/modify/delete an event).
Display: scan existing schedule.

Test circuits

- Press the ✋ key.
- The first circuit will be displayed.
- Repeatedly press the ✋ key to select the desired circuit.
  - Press briefly the ✓ key to test shortly the circuit.
  - Hold down the ✓ key to maintain the circuit activation and enter in the FORCED TEST mode.
  - Press briefly the ✓ key to exit the FORCED TEST mode and deactivate the circuit.

Program a holiday or special day period

- Press the 1 key.
- Select Holidays or Special day with the ▲ or ▼ key.
- Press the ▶ key.
- Enter the start and end dates and select application to all the circuits, the desired circuits or all except the desired circuits.

To program several holiday periods, use the PC software provided with the master clock.

Access the user menu by pressing the M key, to refer to the full record.

	The document concerns the following products :
907461	SIGMA C 110-240VAC - wall
907463	SIGMA C 110-240VAC - rack

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